Fig. 1

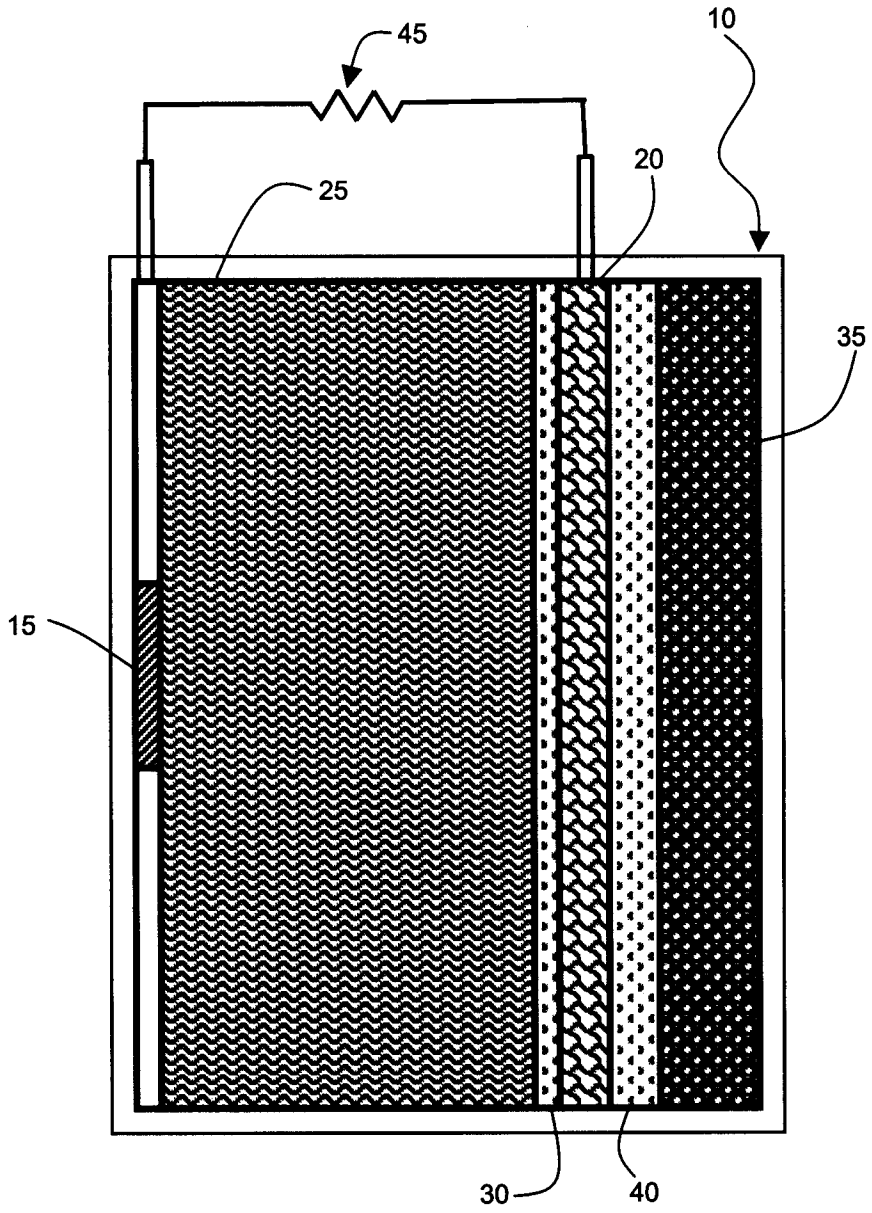


Fig. 2

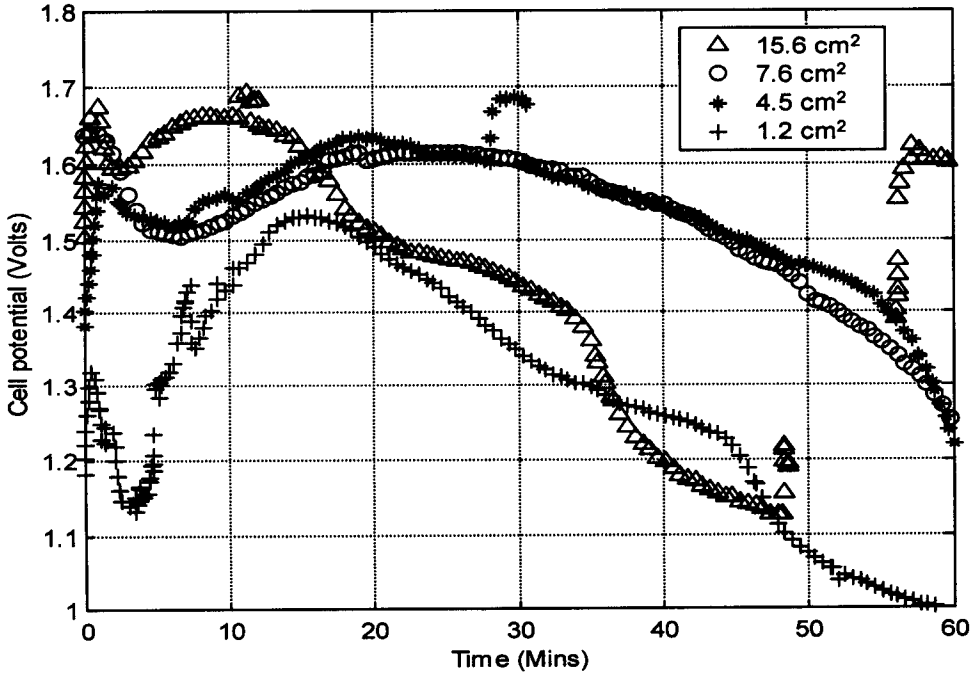

15.6 cm²
7.6 cm²
4.5 cm²
1.2 cm²
Cell potential (Volts)
Time (Mins)
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1
0
10
20
30
40
50
60

Fig. 3

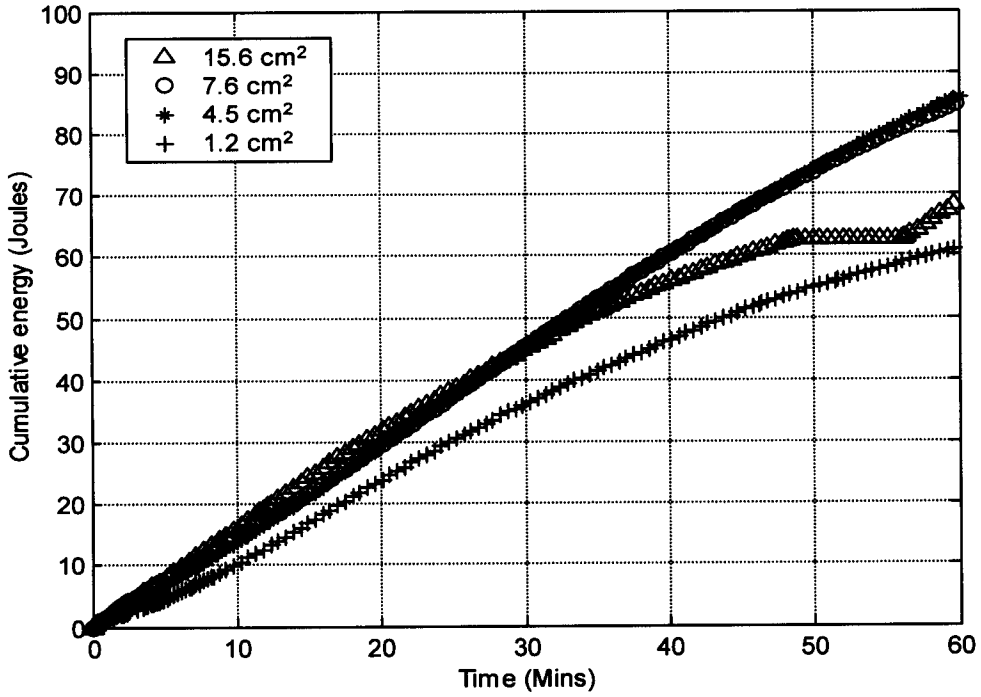

15.6 cm²
7.6 cm²
4.5 cm²
1.2 cm²
Cumulative energy (Joules)
Time (Mins)
0
10
20
30
40
50
60
70
80
90
100

Fig. 4

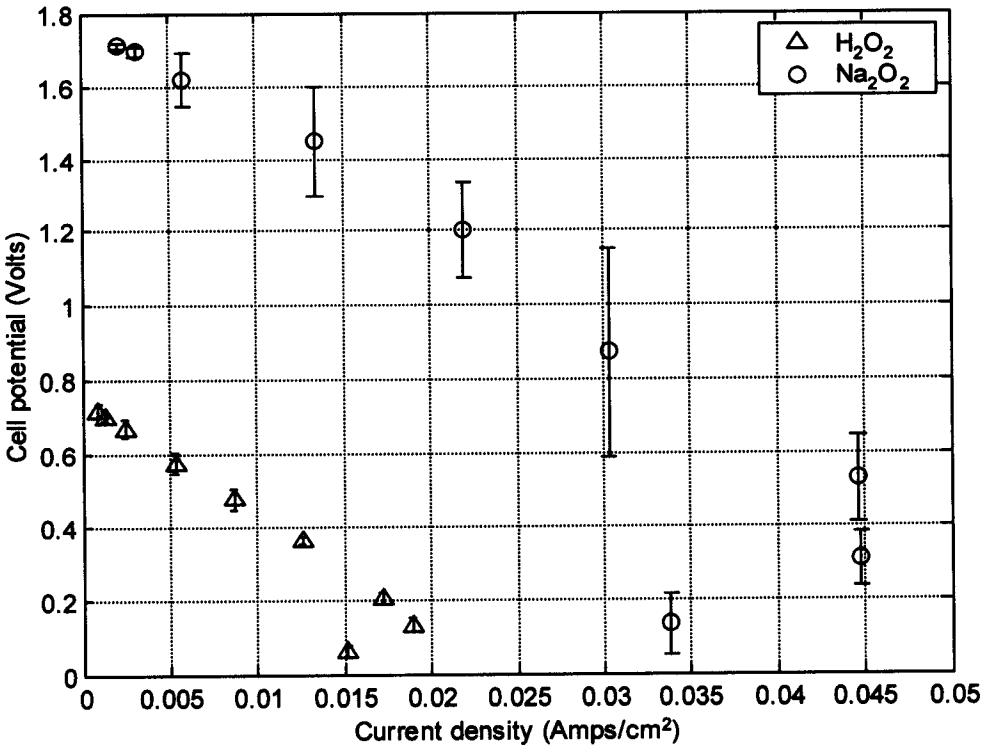

1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Cell potential (Volts)
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045
0.05
Current density (Amps/cm²)
H2O2
Na2O2

Fig. 5

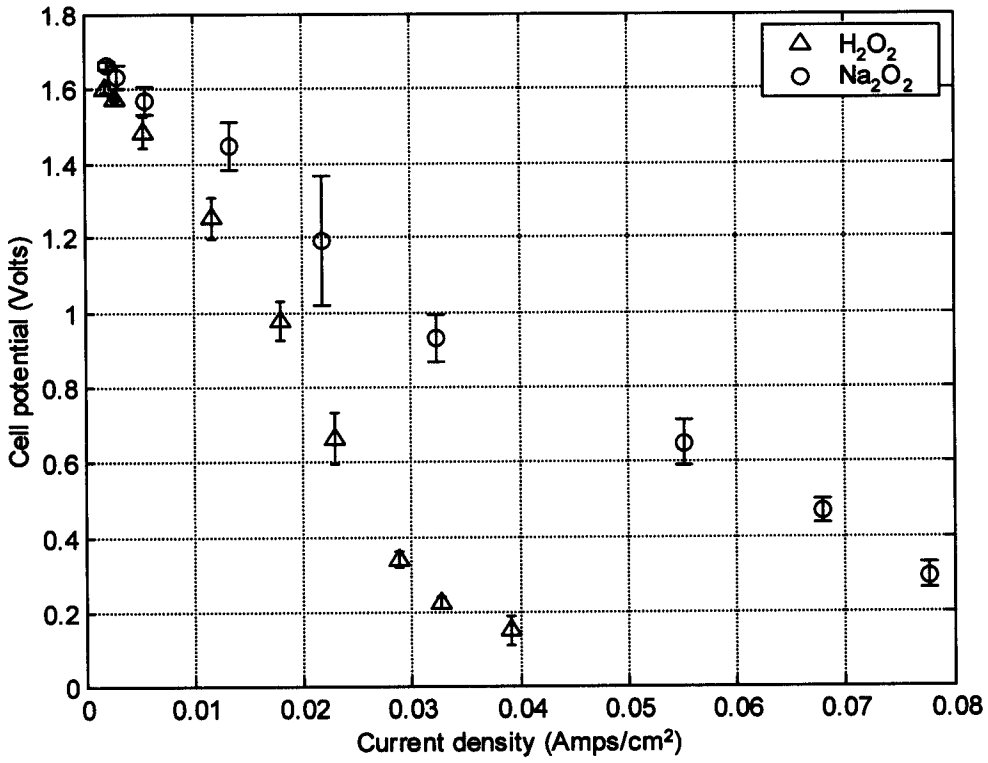

1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Cell potential (Volts)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
Current density (Amps/cm²)
H2O2
Na2O2

Fig. 6

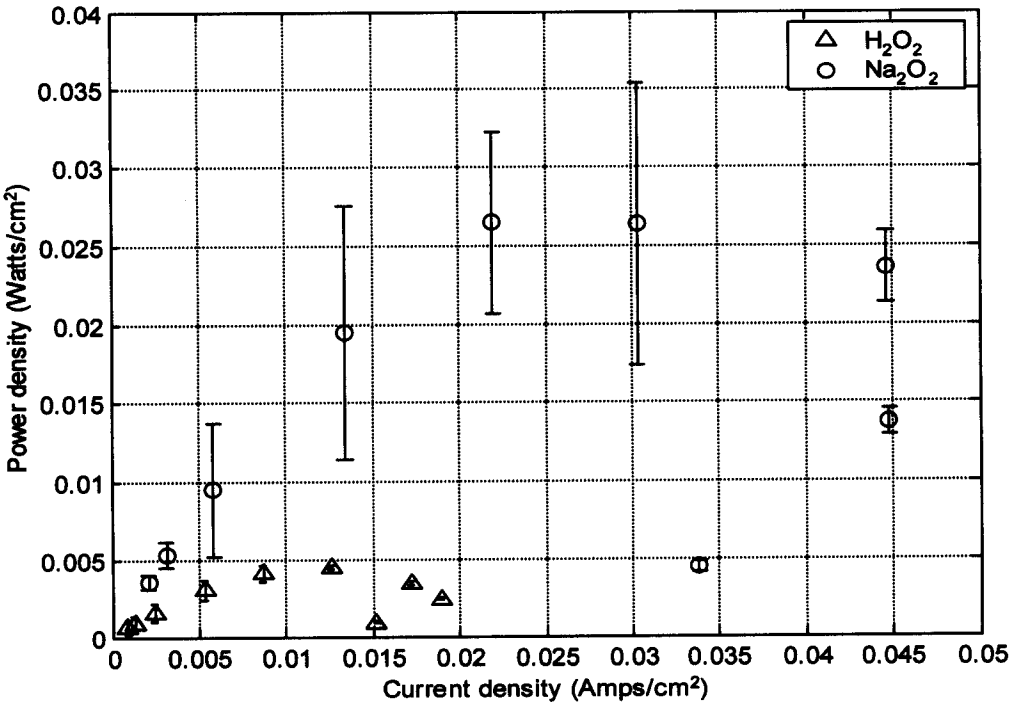

Power density (Watts/cm²)
Current density (Amps/cm²)
H2O2
Na2O2
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045
0.05

Fig. 7

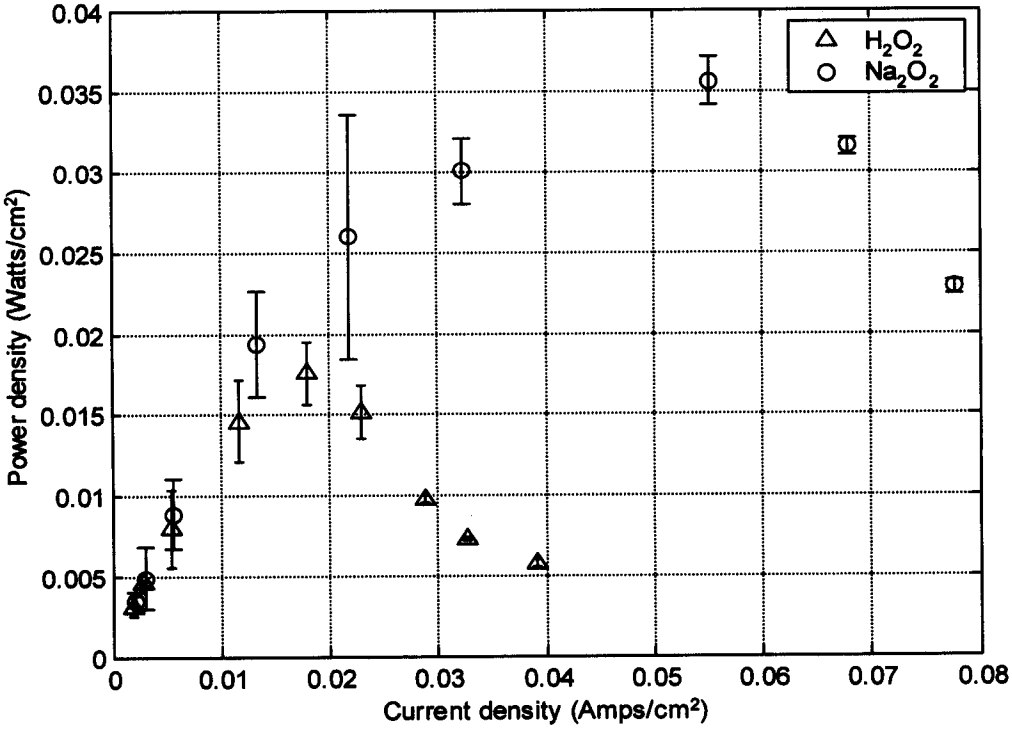

0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Power density (Watts/cm²)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
Current density (Amps/cm²)
H2O2
Na2O2

Fig. 8

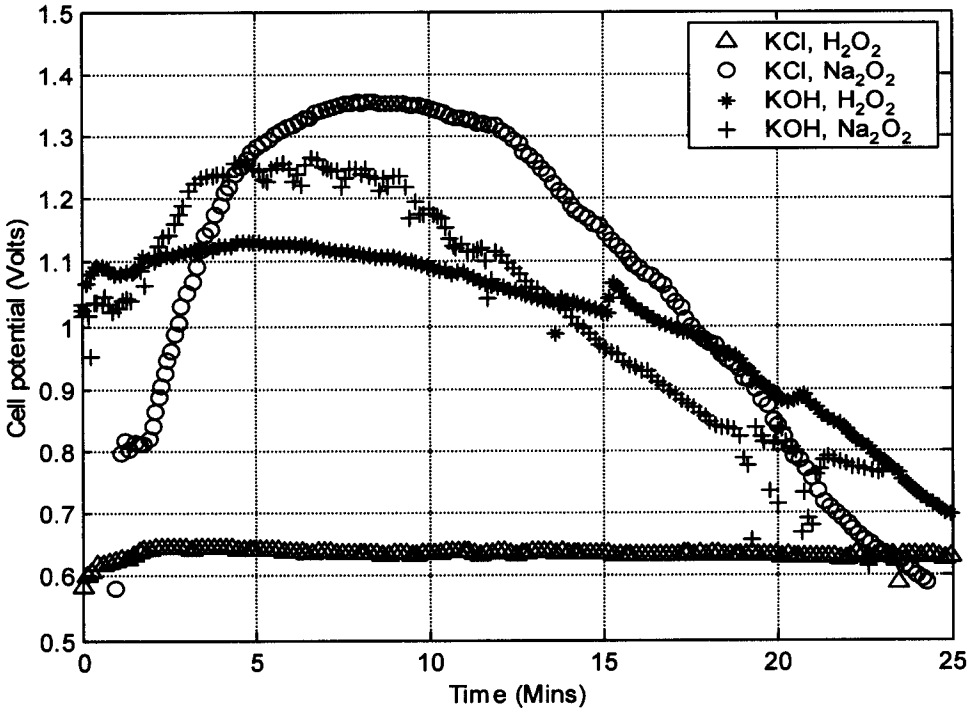

KCl, H_2O_2
KCl, Na_2O_2
KOH, H_2O_2
KOH, Na_2O_2
Cell potential (Volts)
Time (Mins)
1.5
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0
5
10
15
20
25

Fig. 9

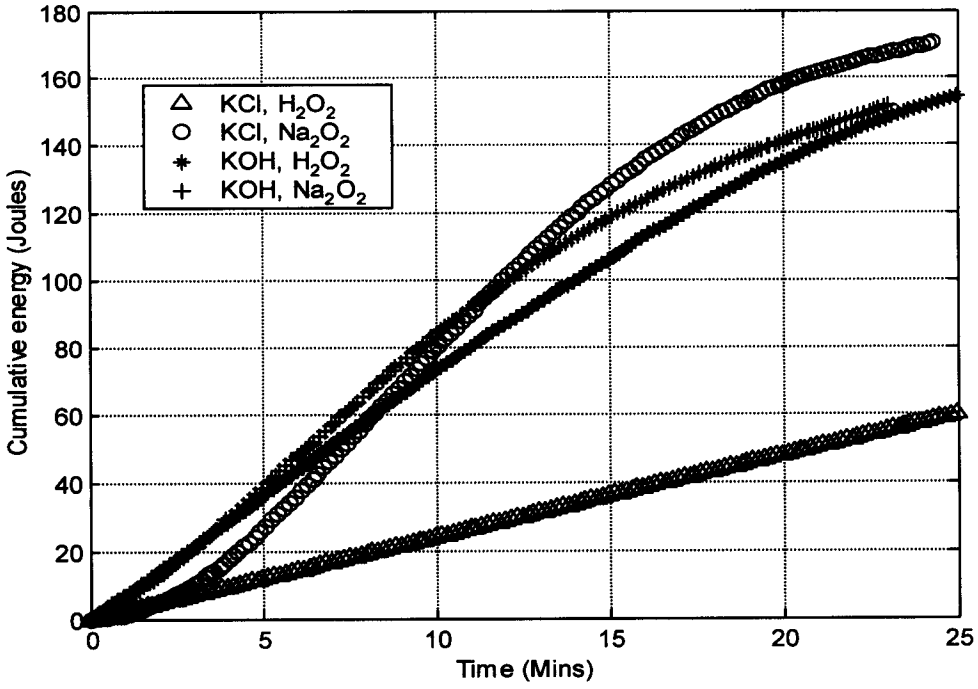

180
160
140
120
100
80
60
40
20
0
0
5
10
15
20
25
Cumulative energy (Joules)
Time (Mins)
KCl, H_2O_2
KCl, Na_2O_2
KOH, H_2O_2
KOH, Na_2O_2

Fig. 10

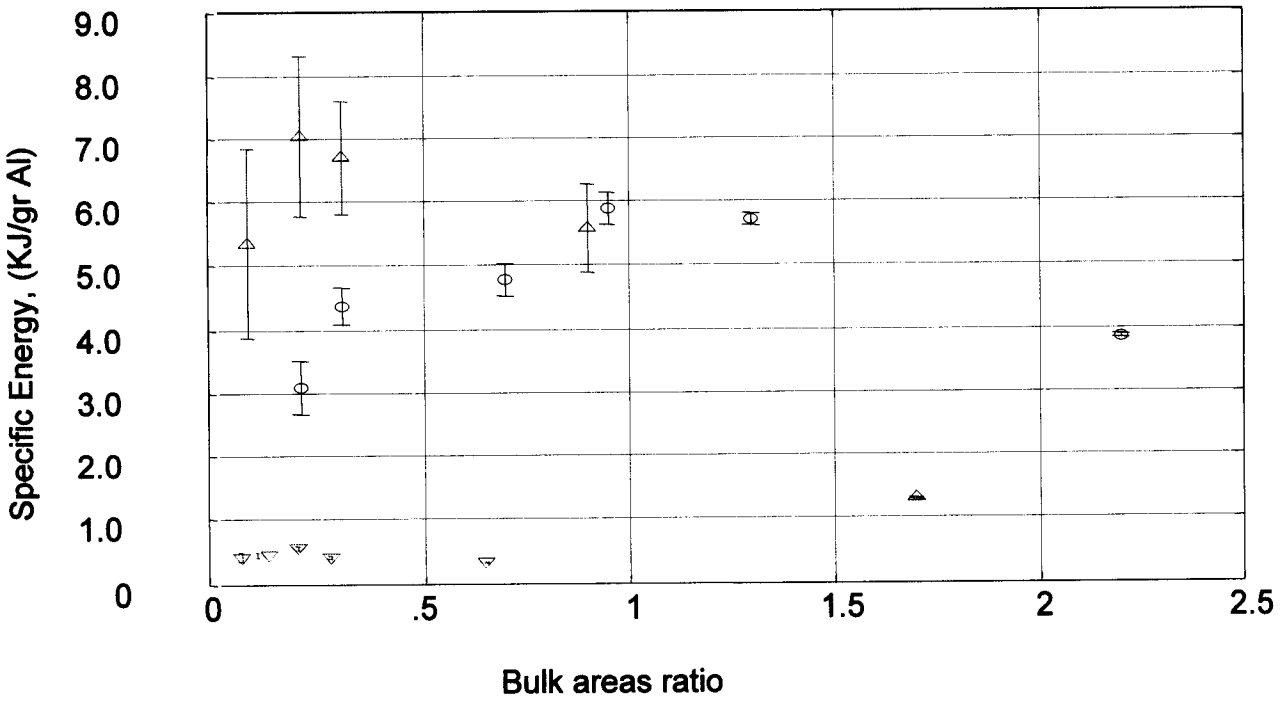
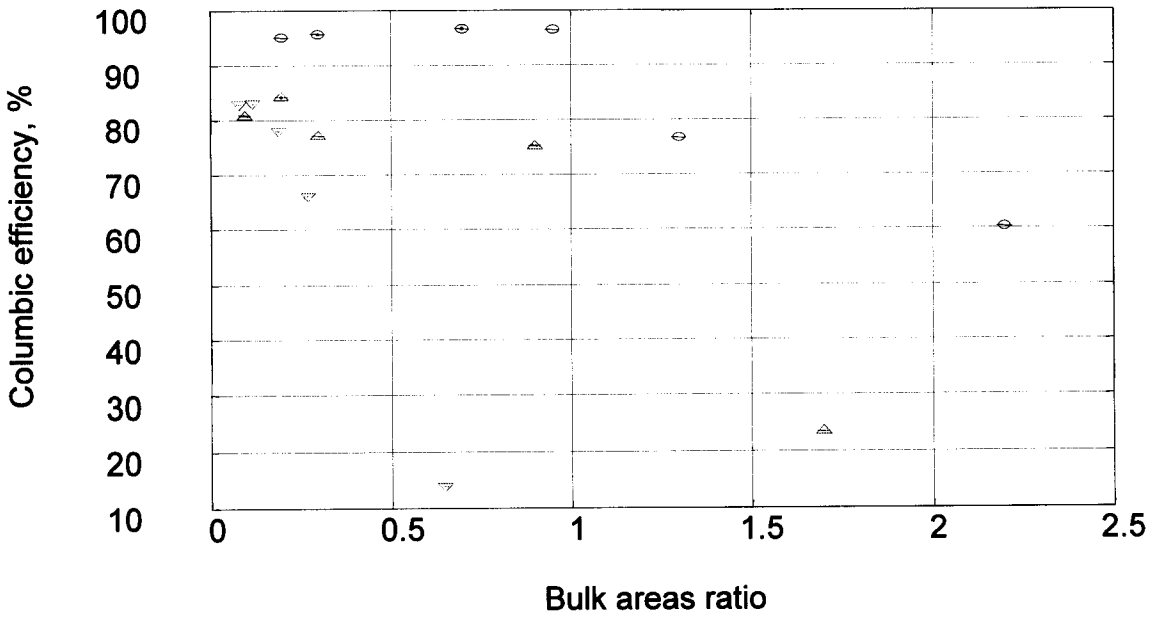

9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
Specific Energy, (KJ/gr Al)
0
.5
1
1.5
2
2.5
Bulk areas ratio

Fig. 11



$$\text{Coulumbic Efficiency} = \left(\frac{Q_p^{\text{Experimental}}}{Q_p^{\text{Theoretical maximum}}} \right) 100$$

$$= \left(\frac{\int_0^t (I \exp(t)) dt}{\left(\frac{\text{x gr Al}}{26.98 \text{gr Al/Al mole}} \right) \left(\frac{3\,\bar{e}\,\text{mole}}{\text{Al mole}} \right) \left(\frac{96500\text{C}}{\bar{e}\text{mole}} \right)} \right) 100$$